

- 1 What is claimed:
- 2 1. Amphipathic polymer particles prepared by polymerizing a plurality of  
3 components comprising:  
4 an unsaturated monomer containing a hydrophobic moiety, and  
5 an unsaturated monomer containing a convertible moiety that is hydrophobic in  
6 an acidic environment and hydrophilic in a basic environment.
- 7 2. The amphipathic polymer particles of claim 1, wherein the content of polymeric  
8 units derived from the unsaturated monomer containing a convertible moiety is in the  
9 range of 1% to 60% by weight.
- 10 3. The amphipathic polymer particles of claim 1, further comprising a polymerizable  
11 dye monomer.
- 12 4. The amphipathic polymer particles of claim 1, further comprising a cross linker.
- 13 5. The amphipathic polymer particles of claim 1, wherein the content of polymeric  
14 units derived from the unsaturated monomer containing the hydrophobic moiety is in the  
15 range of 30% to 99% by weight, and the content of polymeric units derived from the  
16 unsaturated monomer containing the convertible moiety is in the range of 1% to 60% by  
17 weight.
- 18 6. A method of preparing amphipathic polymer particles comprising the steps of:  
19 admixing an aqueous carrier, an unsaturated monomer containing a hydrophobic  
20 moiety, an unsaturated monomer containing a convertible moiety, and a surfactant to  
21 form an emulsion;  
22 initiating a polymerization by adding a catalyst to the emulsion,  
23 continuing polymerization at a temperature and for a period of time sufficient to  
24 form amphipathic polymer particles,  
25 wherein the amphipathic polymer particles have a size range of 50–500 nm.
- 26 7. The method of claim 6, further comprising the step of filtering the reaction  
27 mixture through a filter.
- 28 8. The method of claim 6, wherein the emulsion further contains a polymerizable  
29 dye monomer.
- 30 9. The method of claim 6, wherein the emulsion further contains a cross linker.
- 31 10. The amphipathic polymer particles produced by the method of claim 6.
- 32 11. An ink composition comprising:  
33 a vehicle,  
34 a surfactant,

1 a pigment, and  
2 amphipathic polymer particles prepared by the method of claim 6,  
3 wherein said vehicle is water or a mixture of water and one or more humectants.

4 12. An ink composition comprising:  
5 a vehicle,  
6 a surfactant, and  
7 amphipathic polymer particles prepared by the method of claim 8,  
8 wherein said vehicle is water or a mixture of water and one or more humectants.

9 13. Amphipathic polymer particles prepared by polymerizing a plurality of  
10 components comprising:  
11 an unsaturated monomer containing a hydrophilic moiety, polymerized through an  
12 ATRP process, and  
13 an unsaturated monomer containing a hydrophobic moiety, polymerized in an  
14 emulsion,  
15 wherein the amphipathic polymer particles have a size range of 50-500 nm, and a  
16 polydispersity index in the range of 1-1.2.

17 14. The amphipathic polymer particles of claim 13, further comprising a  
18 polymerizable dye moiety, polymerized through the ATRP process.

19 15. The amphipathic polymer particles of claim 13, further comprising a cross linker  
20 polymerized in the emulsion.

21 16. The amphipathic polymer particles of claim 13, wherein the content of the  
22 hydrophobic moiety is in the range of 30% to 99% by weight, the content of the  
23 hydrophilic moiety is in the range of 1% to 60% by weight,

24 17. A method of preparing amphipathic polymer particles comprising the steps of:  
25 admixing an initiator having one or more radically transferable atoms or groups, a  
26 hydrophilic monomer, a ligand and a catalyst to form an ATRP mix;  
27 admixing one or more hydrophobic monomers, a surfactant, and water to form an  
28 emulsion;  
29 adding the emulsion to the ATRP mix to form the amphipathic polymer particles,  
30 wherein the amphipathic polymer particles having sizes of about 50 to about 400  
31 nm, and a polydispersity index of 1-1.2.

32 18. The method of claim 17, further comprising the step of filtering the reaction  
33 mixture through a filter.

- 1 19. The method of claim 17, wherein the ATRP mix further comprises a  
2 polymerizable dye monomer.
- 3 20. The method of claim 17, wherein the emulsion further comprises a cross linker.
- 4 21. The amphipathic polymer particles produced by the method of claim 17.
- 5 22. An ink composition comprising:  
6 a vehicle,  
7 a surfactant,  
8 a pigment, and  
9 amphipathic polymer particles prepared by the method of claim 17,  
10 wherein said vehicle is water or a mixture of water and one or more humectants.
- 11 23. An ink composition comprising:  
12 a vehicle,  
13 a surfactant, and  
14 amphipathic polymer particles prepared by the method of claim 19,  
15 wherein said vehicle is water or a mixture of water and one or more humectants.